

# MOSQUITOES COLLECTED IN THE MANÁOS REGION OF THE AMAZON

BY

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## PLATE XIV

The culicidae recorded below were collected by one of us (R. M. G.) at Manáos Amazonas during 1921 and the beginning of 1922. A few of the species were taken in the town or its outskirts, but the great majority were obtained in the forests surrounding Macapa, a small saw-mill about fifteen miles from Manáos on the Rio Negro.

In this region only a dim light is present in the deeper parts of the forests. Here certain mosquitoes bite freely at all hours of the day, so a good deal of collecting was done by the party walking in single file, each individual 'bottling' mosquitoes as they lit on the person in front. Owing to lack of proper lighting facilities, little or no work could be done at night.

The breeding-places of these forest mosquitoes were difficult to locate, open pools are rare in the forest, and almost devoid of larvae when found. The most common breeding-places encountered were (1) reservoirs of water in natural crevices in the bark of trees; (2) rot-holes in trees; (3) water reservoirs in plants.

The food supply of these mosquitoes is doubtful, their chances of biting man are negligible, and animal and bird life seems extremely scarce.

Particular attention was paid to searching for Anophelines, none were discovered in the forest, the only ones recorded *Anopheles (Cellia) albimanus* being taken in the town or outskirts of Manáos.

Newstead and Thomas (1910) suggested that it was 'highly probable that other mosquitoes await the discoverer in a region so rich in insect life . . .'; among the present collection are many

species not recorded hitherto, of which four are new and two appear to be well marked varieties of existing species.

*Sabethes amazonicus*, sp. n.

**FEMALE.** *Head.* *Proboscis* long and slender, gradually enlarged apically. *Clypeus* and *tori* black with grey pruinosity. Scales of occiput with deep blue, violet and green reflections above, white beneath.

*Prothoracic lobes* covered with metallic scales with bright blue and green reflections varying according to the light; a row of coarse black bristles along the margin. *Mesonotum* largely denuded, the scales present similar to those of prothoracic lobes. *Scutellum* with lateral lobes metallic green scaled, mid lobe denuded. *Metanotum* with four coarse black setae. *Pleurae* and *coxae* with flat white scales.

*Abdomen:* Tergite of first segment with bright metallic green scales; white at sides. Scales of rest of tergites metallic with deep blue, pale blue, and green reflections according to the direction in which they are viewed. Sternites white scaled.

*Wings* with strong reddish-brown infuscation. Scales on knobs of halteres metallic yellowish-green.

*Legs* long and slender. Hind legs with paddles of long, outstanding scales involving distal half of tibia, metatarsus, and most of second tarsal segment; the longest scales about 1.2 mm. Front legs with tufts of outstanding scales on the distal half of the tibia and a few slightly raised scales at base of metatarsus; longest scales of tufts about 0.5 mm. Hind legs entirely without raised scales. Vestiture dark brown, with bronzy, coppery and violet reflections, femora, tibiae and metatarsi without white. Front tarsi with segments three, four and basal third of five white ventrally, segment four with dark spot at middle; mid tarsi with second, third and basal half of fourth segments white all round, except narrowly at the joints. Hind tarsi with segments three, four and five ventrally white, except narrowly at the joints.

Length: *c.* 7.0 mm. Wing: *c.* 5.5 mm.

*Type.* One female taken about three hundred yards deep in the forest, Macapa, 22nd December, 1921.

This species evidently comes very near *S. tarsopus*, D. & K., with which it agrees in having tufts of outstanding scales on the front and mid legs only. It differs from that species in the entire absence of white scales on the femora and tibiae and in the details of the tarsal markings.

*Sabethoides nitidus*, Theob.

Two larvae taken from a rot-hole in a 'Breau' (native name) tree in the forest near Manáos were brought to Liverpool alive. They were kept in an incubator at a temperature from 70° to 80° F., and one of them pupated, the pupa giving rise seven days later to a female *Sabethoides*. Although the specimen differs in certain details of coloration from Theobald's (1901), Howard, Dyar and Knab's (1915), and Dyar's (1919), descriptions of *S. nitidus*, it is referred to this species in the absence of male specimens from this region.

The specimen is more brightly coloured than typical *S. nitidus*, many of the head scales having brilliant pink and mauve tints, the scales of the prothoracic lobes and mesonotum are brilliant peacock-blue, not greenish-blue as in *S. nitidus*. The abdomen (fig. 1), seen



A.M.E.

FIG. 1. *Sabethoides nitidus*, Theo., from Manáos region, female abdomen from above.  
× c. 30.

from above, is coppery with violet reflections, and there are irregular basal patches of brassy scales on segments three and seven; broad, paired, dorsal patches, almost united in the middle, on segments four and five, and on segment six a complete broad, basal band. These brassy scales are quite conspicuous to the naked eye. Lateral basal white spots only present on last segment, not in all segments as in *S. nitidus*. The mid legs are white scaled above on the apical three-quarters of segment two and on segment three, four and five, except the extreme tip of five.

The larva of this species does not appear to have been described hitherto.

LARVA. Stage IV (fig. 2). Head broad. Mental plate with a

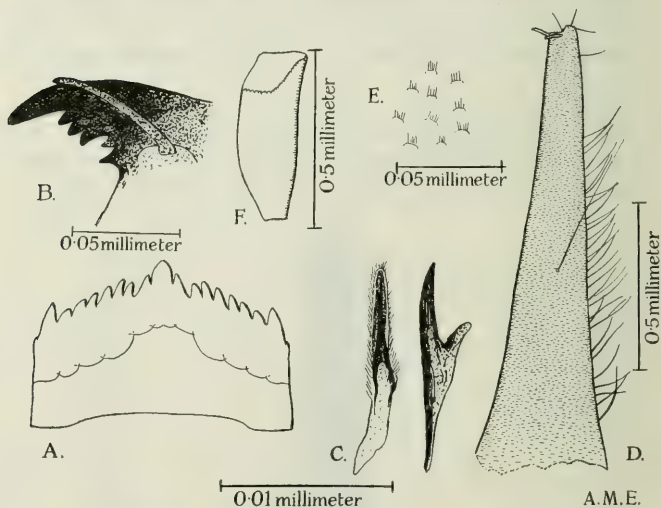


FIG. 2. *Sabetboides nitidus*, Theo., from Manáos region. A-E—larva; F—pupa. A—mental plate; B—dentition of mandible; C—spines of lateral comb (branched one in lateral view); D—siphon tube; E—part of surface of siphon tube enlarged; F—respiratory trumpet of pupa.

large median tooth and eight smaller ones on each side. Maxillae resembling those of *Sabethinus undosus* as described and figured by Howard, Dyar and Knab (1915), but, left maxilla with five teeth on

inner margin, right maxilla with four teeth in this position. Mandibles similar to *S. undosus*, but dentition (fig. 2 B), *six* (not four) teeth on a process, the terminal one large and falciform. Comb of eighth segment of twenty spines arising from membranous integument, spines thorn-shaped, some with a secondary pointed process (fig. 2 C). Siphon tube three and a third times as long as greatest width, surface with groups of microscopic hairs (fig. 2 E), a row of delicate sub-equal hairs arising from posterior margin for more than two-thirds of its length. Anal segment with plate reaching about half way down segment, dorsal angle on each side with two tufts of two setae; sub-ventrally a tuft of two and a tuft of three setae; lateral angles of plate with a tuft of two setae at each side. Anal gills sub-cylindrical, bluntly rounded, about three-fifths as long as siphon tube. Dorsal hooks of seventh segment, if present, so small as to be undetectable in crumpled pelt.

PUPA. Multiple tufts present on seventh and eighth segments. Respiratory trumpets moderately short and stout, opening wide (fig. 2 F). In life, abdomen with conspicuous dark segmental bands.

The coloration of this metallic scaled species appears to be extremely variable and open to a variety of interpretations. The extent of white on the hind tarsi is also subject to a considerable amount of variation in the descriptions of authors. The dorsal aspect of the abdomen was originally described by Theobald (1901) as 'deep metallic blue with basal coppery bands'; Howard, Dyar and Knab (1915) say 'dorsal vestiture metallic blue and green'; and Dyar (1919), in his coloration table, states that the abdomen has 'iridescent whitish, segmental bands.' A specimen labelled '*S. confusus*' in the British Museum was examined by one of us (A. M. E.), and the coloration of the abdomen above was found to be dark metallic violet with scattered pale scales, and on last segments pale basal bands.

Until a male from this locality is discovered, it must remain undecided whether the range of *S. nitidus* can be considered as extending as far westwards as Manáos, or whether the genus is here represented by a distinct species.

*Wyomyia negrensis*, sp. n.

FEMALE. *Metanotum* with flat white scales and a few pale setae intermixed, a tuft of dark setae posteriorly. In other respects,

also, closely resembling *Cleobonnea occulta*, B. W. and B., except that scales on disc of mesonotum *broadly lanceolate*.

MALE. Coloration as in *C. occulta*, but legs differing considerably. Mid legs white ventrally and dark above throughout. Hind legs with femora, tibiae, metatarsi and basal quarter of second tarsal segment white ventrally; rest of tarsi brassy beneath.

HYPOPYGIUM (fig. 3). Side-pieces, tenth sternites and ninth tergites as in *C. occulta*. *Clasper* with a slender, recurved, basal 'lobe' (Dyar, 1919) (1), with retrorse pointed tip, and a wide dilation (*d.*), from which arise three lobes; an outer, rather slender lobe (2), with indications of a row of spines; a long curved lobe (3), with a row of teeth along inner side; an inner broad triangular

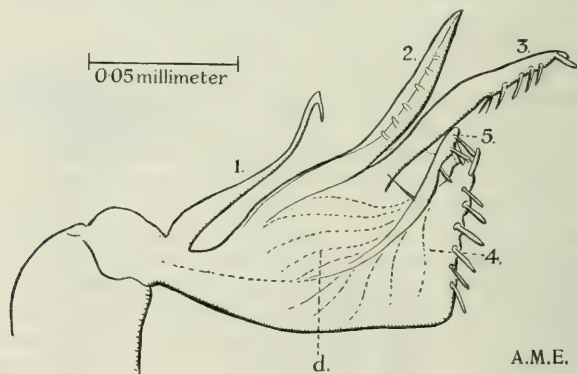


FIG. 3. *Wyeomyia negrensis*, sp.n., male hypopygium, clasper. *d.*—dilation; 1, 2, 3, 4, and 5, lobes of clasper.

lobe (4), with coarse teeth along distal edge; and a secondary lobe (5), with teeth on internal surface arising from fourth lobe.

LARVA. Stage IV. Head wider than long, widest at posterior angles. *Mental plate* triangular, with a median tooth and eleven sub-equal teeth on each side. *Maxilla* with a terminal transparent hook-like tooth, and a row of ten transparent teeth along inner side; a sub-apical tuft of delicate hairs, and near them a single seta on a tubercle, a row of hairs internally, and a short, stout spine near outer margin. *Thorax* with lateral dense tufts. Spines of comb of

eighth segment in a sub-triangular patch. Length of siphon tube about three times its greatest width, false pecten of four spines on distal half, three multiple tufts dorsally and a long multiple tuft ventrally at base. Anal segment with two pairs of dorsal tufts, one of five, one of two hairs; lateral hairs single, sub-ventral tufts of three and two hairs.

PUPA. A tuft of two long hairs bent as shewn in fig. 4D near

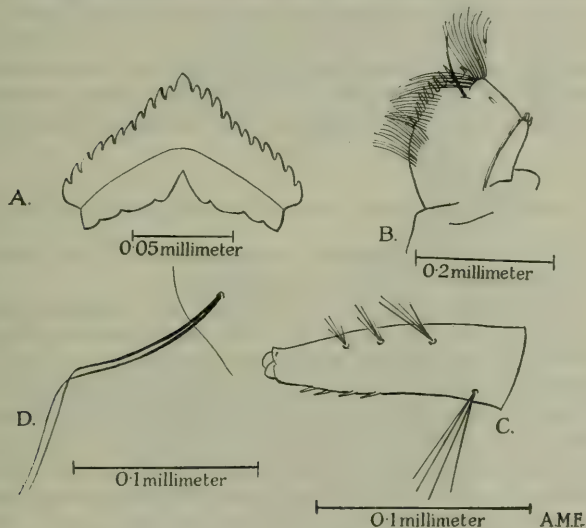


FIG. 4. *Wyomyia negrensis*, sp.n. A, B, and C—larva; D—pupa. A—mental plate; B—maxilla; C—siphon tube; D—bent hairs of cephalothorax of pupa.

margin of each eye. A pair of sub-median tufts of eight branched hairs and sub-lateral tufts of four simple hairs behind insertions of antennae. Otherwise resembling pupa of *C. occulta*.

*Types*. One male and one female, bred from larvae living in the stem of *Bananeira braba* (wild banana) in the forest near Macapa, 20th Decemer, 1921. *Co-types*, five females from the same source.

This species is closely related to *Cleobonnea occulta*, B. W. and B., but there are marked differences in the coloration of the



legs of the male, and in the structure of the clasper. The mid legs of *C. occulta* are described as 'pale' beneath throughout, and the third, fourth and fifth segments white above. The hind legs are described as white beneath throughout, the last three tarsal segments brassy above. The male hypopygium has the clasper with only three lobes, closely resembling, 1, 3 and 4 of *W. negrensis* according to Dyar's (1919) figure of this structure; the lobes corresponding to 3 and 4 are differentiated much nearer the base than in *W. negrensis*; the dilation (*d.*) is absent. The branch (5) is evidently fused with the inner lobe (4) along its whole length in *C. occulta*. The quadrilobate condition of the clasper excludes *W. negrensis* from Dyar's sub-genus *Cleobonnea*, and it is here placed provisionally in the genus *Wyeomyia*.

*Culex (Neomelanoconion) chrysothorax*, Newstead and Thomas.

This species was frequently taken from a pool at the Bosque, about five miles from Manáos (Plate XIV, fig. 3).

Dyar (1918) suggested that it might be synonymous with *C. (Choeroporpa) chrysonotum*, D. and K.; and Bonne-Wepster and Bonne (1921), examined the types in the British Museum, and came to the conclusion that *C. chrysothorax* is a distinct species differing from *C. chrysonotum* 'by the broad white apices of its femora and tibiae,' and other characters. In view of the fact that most of the specimens in our series have the apices of the femora and tibiae only narrowly and faintly pale, the male hypopygium was examined and compared with that of *C. chrysonotum* described by Dyar (1920). Five specimens were examined; they showed quite distinct differences as follows:—

Inner branch of upper division of lobe of side-piece with larger appendage (fig. 5 A 1), a long, slender filament with recurved pointed tip, not 'somewhat flattened and blade-like' as in *C. chrysonotum*. Halves of mesosome (second plates, Dyar) (fig. 5 B) with a very long horn extending in the same direction as the basal hooks, arising nearer to the apex than the base; not near the base as in *C. chrysonotum*. It should be stated that, owing to the fact that the apical portions of the plates lie in a different plane from the basal main portion and from the horns, a considerable



number of totally different appearances of the whole structure may be obtained by altering the orientation (see fig. 5, C and D). In fig. 5 B the mesosome is drawn as seen when allowed to come to rest

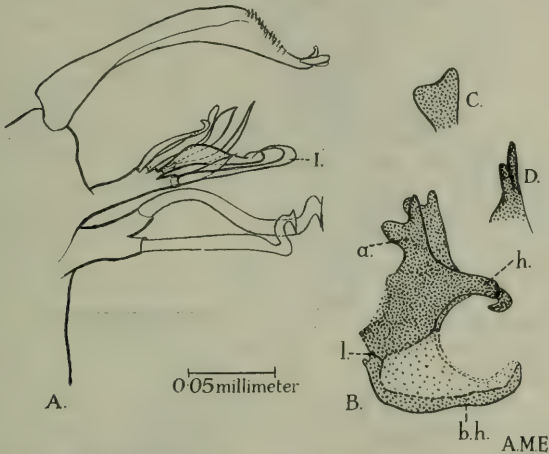


FIG. 5. *Culex chrysothorax*, Newstead and Thomas, male hypopygium. A—clasper and lobes of side piece, 1—appendage referred to in text; B—entire mesosome, ventro-lateral view; b.b.—basal hooks; l—line of fracture between basal hooks and halves of mesosome; h—horn; C and D—ventral and lateral views of distal portion of half of mesosome.

on its side; as the two halves diverge at an angle, neither half is seen in true lateral view.

*Culex originator*, sp. n.

MALE. *Palpi* very short, slightly less than one-sixth of proboscis, slender, pointed. *Proboscis* swollen distally, bent beyond middle. *Occiput* with pale brown, narrow curved scales in middle, and whitish scales at sides and margins of eyes. Upright forked scales numerous, black. *Mesonotum*: integument dark grey, clothed with very narrow, curved, brown scales with slight greenish reflections, and numerous very long, coarse, black setae; two narrow, bare, dorsal stripes extending almost to ante-scutellar space, and a pair of wider, curved, sub-lateral bare lines extending from before wing roots outwards and backwards to lateral lobes of scutellum. Scutellum

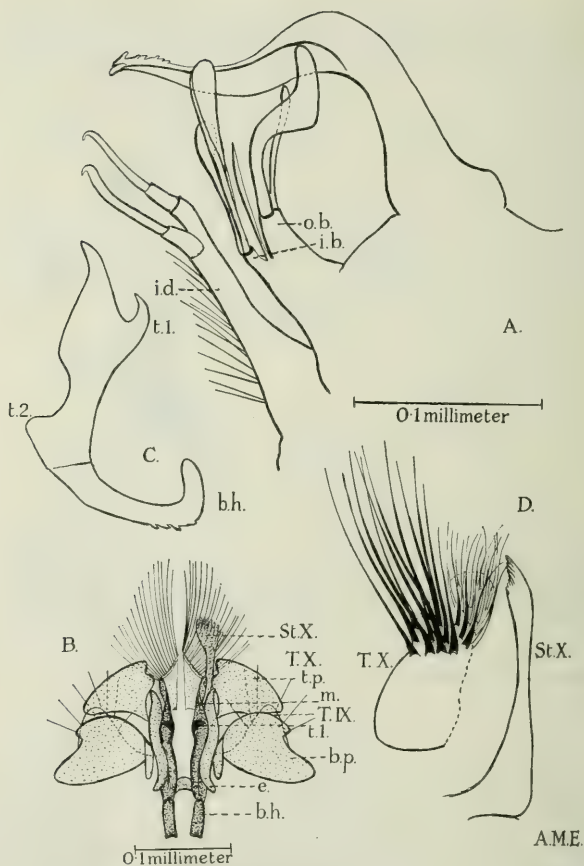


FIG. 6. *Culex originator*, sp.n., male hypopygium. A—clasper and lobes of side piece; i.b. and o.b.—inner and outer branches of outer division; i.d.—inner division; B—aedoeagus, dorsi-ventral view; b.b.—basal hooks; b.p.—basal plate; m.—half of mesosome; e—paramere; St.X.—tenth sternite; T.IX.—ninth tergite; T.X.—tenth tergite; t.1.—ventral tooth of mesosome; t.p.—transparent, triangular plate; C—half of mesosome and basal hook, lateral view; b.b.—basal hook; t.2.—dorsal tooth; D—tenth segment, lateral view. A, C, and D to same scale.

unicolorous with mesonotum. Pleurae green, with black setae and some pale ones. Abdomen with dark brown scales above, and on segments seven and eight very pale lateral basal spots. *Legs* clothed with dark brown scales; femora pale beneath; hind tibiae with a line of scales beneath with brilliant yellowish, silvery reflections, except on basal quarter and at distal extremity.

Wings as in *C. (Isostomyia) conservator*, D. and K.

Length: *c.* 3.5 mm. Wing: *c.* 2.5 mm.

**HYPOPYGIUM** (fig. 6) *Side-piece* short, rounded, width more than half the length. An area of dense setae near apex on inner side. *Clasper* angularly curved at right angles, gradually narrowing from bend to tip as shown in fig. 6A. Outer division of lobe of side-piece with distal half divided. Outer branch (*o. b.*) bearing a large filament distally expanded as shown in the figure, and a small spine. Inner branch (*i. b.*) of outer division of lobe of side-piece bearing a stout seta at base, and a pair of expanded filaments distally, one rather more distal than the other. Inner division of lobe of side-piece (*i. d.*) a stout arm, exceeding the outer division, with a row of setae arising from inner side and with two rod-like appendages with curved, pointed tips, the inner situated proximal to the outer. Tenth sternites with slender stem and expanded, comb-shaped apices, with nine teeth. *Apices of tenth tergites with a dense tuft of setae* (fig. 5D), the longest considerably longer than the tenth tergites. Halves of mesosome (second plate, Dyar), lateral aspect (fig. 5C) distally pointed, with a strong, pointed tooth on upper (true ventral) edge and a blunt tooth on lower edge near basal hooks; dorso-ventral aspect (fig. 5B, *m.*), distal portion spatulate. Basal hooks well developed, strongly curved. Ninth tergites (*t. ix.*) rounded, with four setae. 'Transparent triangular plates,' Dyar (*t. p.*), present between basal plates and ninth tergites.

**FEMALE.** Vestiture similar to the male, but upright forked scales of occiput dark brown; dorsal bare lines of mesonotum partially obliterated on posterior half; faint basal lateral, pale spots on abdominal segments three to six, and apical, lateral, pale spots on segment seven.

Length: *c.* 3.0 mm. Wing: *c.* 2.5 mm.

**LARVA.** Stage IV (fig. 7). Dorsal head hairs consisting of an inner pair of long tufts (*i. t.*) associated with a single long seta, and

an outer pair of shorter tufts (*o. t.*). Antennae normal, spiny. *Mental plate* (fig. 7 B) narrow with a very wide median tooth and eight smaller ones on each side, the last one remote. *Thorax* rounded, wider than long. *Siphon tube* (fig. 7 C) very long, length nearly eleven times the average width. Pecten not reaching beyond basal quarter, three long hairs beyond.

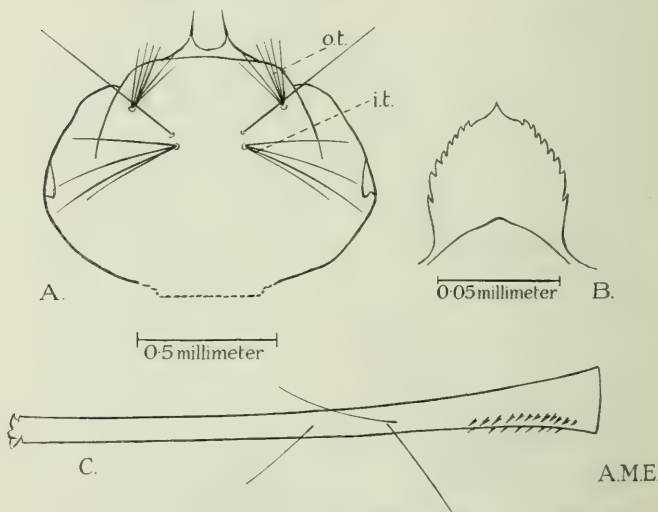


FIG. 7. *Culex originator*, sp.n., larva. A—head, dorsal view; B—mental plate; C—siphon tube.

*Type.* Male and female bred from larvae obtained from *natural* holes in the bark of the '*Carapana uba*' tree (native name = 'Home of the mosquito') about half a mile in the forest at Macapa, 21st December, 1921, emerged 1st January, 1922 (Plate XIV, fig. 2). *Co-types*, two males and two females from the same source, and one male from larva in rotten tree stump in forest at Macapa.

The characters of the male hypopygium readily separate this species from any other described species of *Culex*, but outwardly it closely resembles *Culex (Isostomyia) conservator*, D. and K. It differs from this species as described by Howard, Dyar and Knab

(1917) in having a line of brilliant yellowish, silvery scales beneath the hind tibiae, and faint pale segmental lateral abdominal spots. It would appear that the male of *C. conservator* has the upright forked scales of the occiput brown, not black, as in *C. originator*, and that the bare lines on the mesonotum do not extend more than half way back. Dyar (1922) discusses the hypopygial characters of *C. conservator* and the other two species of *Culex* with the male palpi as short as those of the female, *C. isostomyia bifoliata*, Dyar, and *C. micraedes corrigani*, D. and K. From his description of the shape of the clasper in *Isostomyia*, it seems probable that *C. originator* should be put in this sub-genus, although the divided outer division of the lobe of the side-piece, and the presence of conspicuous tufts of spines at the apices of the tenth tergites distinguish it markedly from the other two species. The latter character appears to be unique among American species of *Culex*.

*Culex corniger*, Theo.

A perfect female was taken in low herbage in a garden in Manáos, 7th June, 1921.

*Mansonia coticula*, Dyar and Knab.

Two females of this distinctive and beautiful species were caught about one mile deep in the forest at the saw mills, Macapa, 11 a.m. to 3 p.m., 7th December, 1921.

The type specimens were taken in the Panama region, and since its discovery the species does not appear to have been found elsewhere. Our specimens, however, agree with Howard, Dyar and Knab's (1915) description so exactly that we have no hesitation in assigning them to this species.

Females of *Manosnia titillans*, Walker, and *M. amazonensis*, Theo., were frequently taken biting man by day in the forest near Macapa.

*Haemagogus (Stegoconops) equinus*, Theob.

Three females taken in the forest near the saw mills, Macapa, 11 a.m. to 3 p.m., 7th, 22nd and 23rd November, 1921, are referred to this species.

*H. equinus* has not hitherto been recorded from the Manáos region, but it has a very wide distribution in South America, Dyar (1921), and in the absence of males the present specimens must be regarded as this species.

*Psorophora lutzii*, Theo.

In addition to numerous females, a male of this species was caught in the forest near Macapa saw mills, 10 December, 1921.

The male of *P. lutzii* does not appear to have been described hitherto. It differs from the female in having yellow scales immediately in front of the ante-scutellar space, a character which



— 0.1 millimeter —

FIG. 8. *Psorophora lutzii*, Theo., male hypopygium, apex of claspette (harpagone); S.1, S.2, S.3 types of setae referred to in the text.

was confirmed by Mr. F. W. Edwards, who kindly examined the male specimens in the British Museum collection.

**HYPOPYGIUM** (fig. 8) with side-pieces, tenth sternites and aedoeagus as in *P. posticatus*. The claspettes (harpagones) H., D.

and K. (1917), apically expanded on inner side; with a large terminal 'S'-shaped leaf, a much smaller curved leaf, and a narrow pointed filament distally curled; internal surface with fourteen (this number may be subject to slight variation) long setae with expanded apices. The setae of three types:—I. (fig. 8, *s. 1*) with apices slightly swollen, bearing short simple hairs; II. (*s. 2*) apices considerably expanded, with longer, very delicate hairs, some of which branched; III. (*s. 3*) apices produced into large membranous expanses, with fine, filamentous, branched processes.

Females of this species and of *P. posticatus*, Wied., were the commonest mosquitoes biting by day in the forest near Macapa.

*Aedes (Finlaya) oswaldi*, Lutz, var. *braziliensis*, n. var.

Two perfect males of the *Finlaya* group of *Aedes* were referred to this species, although they differed from it in certain respects.

The differences are tabulated below:—

	<i>A. oswaldi</i>	<i>A. oswaldi</i> var. <i>braziliensis</i>
Mid legs ... ..	2nd tarsal segments with basal <i>third</i> white	2nd tarsal segment with basal <i>half</i> white.
Hind legs ... ..	Metatarsus with apical quarter; 2nd tarsal segment with basal <i>third</i> white	Very narrow white rings at these places
Segment VIII of abdomen	Dorsally silver scaled	Dorsally dark scaled

The anterior three-fifths of the mesonotum are covered with very thick, bluish silvery, narrow curved scales, the whitish area being deeply incised behind. The hypopygium resembles that of *A. oswaldi*, but the clasper is capitate distally, not pointed as in Howard, Dyar and Knab's (1912) figure of that species.

*Type* and *co-type* males bred from larvae found in hollow in tree stump, about one and a half miles deep in forest at Macapa, 8th December, 1921.



*Megarhinus horvi*, sp. n.

MALE. *Proboscis* about nine-tenths of the length of the wing, slender, tapering to a point; *palpi* slightly longer than proboscis, vestiture of all but last segment above predominantly peacock-blue, violet towards ends of segment and in front of false articulation; scales at dilated articulations and false articulations white, with pale mauve reflections; all but last segment with pale scales, appearing brassy or whitish according to the direction of the light. Last segment bronzy scaled with deep purple reflections. *Antennae* with hairs of whorls blackish-brown, second segment dotted on distal two-thirds of inner side, with metallic scales appearing peacock-blue, purple or whitish in different lights; tori black with silvery pruinosity. *Clypeus* short, ochraceous brown, darker in centre, with whitish pruinosity. *Occiput* mostly covered with olivaceous green scales, pale blue ones in front and at sides, white scales along ocular margins and beneath. *Prothoracic lobes* with brilliant blue scales above, violet ones towards margin, and white scales beneath, a row of coarse black setae along margin. *Mesonotum*, viewed without magnification from above, bronze, with a median peacock-blue stripe about one-fifth of the width of the mesonotum at the middle, posteriorly the blue area widens and coalesces with blue patches over the roots of the wings; bronze area bordered by whitish blue at edges of disc. Magnified about fifty times with binocular microscope, the bronze area seen to consist of spindle-shaped scales with brassy, coppery, greenish or light blue reflections, according to the direction in which they are viewed; the scales directed outwards on anterior, inwards on posterior half; blue area consisting of broad, flat, backwardly directed scales, bronze when viewed from behind, metallic peacock-blue from above; pale scales bordering disc at sides and in front broader than spindle-shaped scales on disc, very transparent, whitish, with azure-blue and pale greenish-blue reflections. Scales forming patches over roots of wings peacock-blue, with lighter blue and greenish reflections. Scutellum, without magnification bright metallic blue, very slightly paler than blue of mesonotum; with magnification fifty times, scales on mid and lateral lobes similar, appearing peacock-blue with deep violet reflections, pale blue, translucent pale green or translucent brassy, according to

the direction of the light; mid and lateral lobes with groups of stout, black setae. Pleurae and coxae with patches of dense creamy-white scales. Spiracular bristles seven, black; pre-alars seven, pale straw coloured; upper mesepimerals numerous, very pale.

*Abdomen* above, with segment one metallic pale blue, segments two, three and four with peacock-blue scales, remaining segments and side-pieces bronzy brown, with violet reflections. Sides of segments with apical patches of creamy scales, brilliant blue scales at base, some of scales with whitish and mauve reflections in certain lights.

Scales of venter creamy with silvery reflections, a median dark stripe of bronzy scales with peacock-blue reflections, lateral ciliation short, delicate, pale yellow.

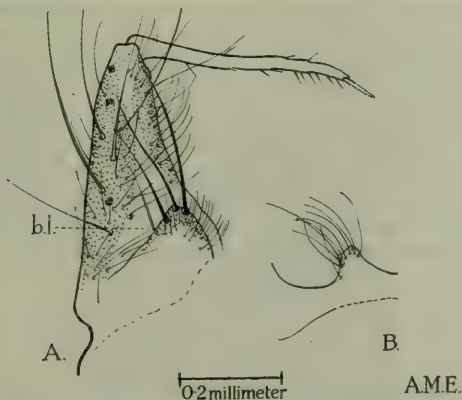


FIG. 9. *Megarbinus borei*, sp.n., male hypopygium. A—side piece; b.l.—basal lobe; B—ninth tergite.

*Legs.* Vestiture of dark scales with deep blue and purple reflections. Femora brassy beneath, knees entirely dark. Hind tarsi with fourth segment white, except at base and apex, and a very narrow line of dark scales on upper surface behind.

**HYPOPYGIUM** (fig. 9). Basal lobe of side-piece with three stout setae at apex, of which two very long, reaching almost to insertion of clasper. Ninth tergites short, with about eleven fine setae.

Length: *c.* 10 mm. Wing: 7 mm.

FEMALE. *Palpi*: coloration above similar to male, but scales at articulations dark, with paler violet reflections; brassy scales at sides confined to basal third, rest with reddish-purple reflections.

*Mesonotum* entirely covered on disc, except on posterior extremity, with dark bronze spindle-shaped scales, which appear deep blue with purple reflections when viewed in a direction parallel to their long axis; posterior portion between wing roots with flat scales of similar coloration. In the normal position the thorax appearing bronzy-brown, except at posterior extremity, and in irregular patches on middle regions of posterior half which appear deep ultramarine blue, owing to the antero-posterior direction of most of the scales in these regions. Laterally the scales directed more or less at right angles to the longitudinal axis, and, therefore, only appearing blue when the thorax is viewed from the side.

*Abdomen*. Similar to male, but blue colour deep ultramarine, and on last two segments above an almost complete apical fringe of brassy scales.

*Legs*. Similar to male, but mid legs with segments two and three white on anterior and dorsal surface, except narrowly at apices and bases; hind legs with segment four entirely whitish scaled, segment five with whitish scales on basal two-thirds anteriorly.

LARVA. Stage IV (fig. 10). *Head*, sub-quadrate, about as wide as long, insertions of antennae rather prominent, front margin deeply emarginate, produced into large prominent lobes on each side, bearing mouth brushes. Antennae cylindrical, slender, rather long, smooth, hairs sparse, internally a tuft of two hairs, externally two longer hairs on apical fourth; apex with a jointed and an unjointed appendage and a hair. Dorsal head hairs fine, three on each side behind frontal lobes, behind and internal to antennae a row of three on each side and a minute tuft internally; a single hair internal to eyes and a small branched one apparently rising from eyes. Mouth brushes consisting of nine curved blades. Labial structures (fig. 10, E, F, G) consisting of a broad chitinous fold (sub-mentum ?) hairy in middle distally with internal surface with median area heavily chitinised, tuberculate and a large stout tooth (*m. t.*) arising in centre: a mental plate attached to dorsal surface of fold (see fig. 10 G, which shows relative position of parts of labium), having a very shallow median tooth with a small tooth on each side and

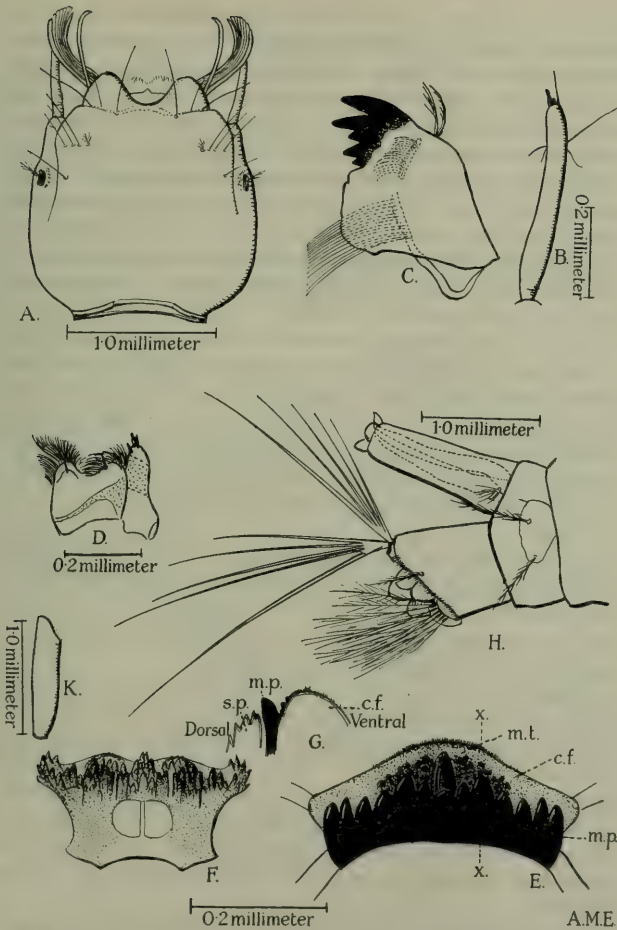


FIG. 10. *Megarbinus borei*, sp.n. A-H—larva. K—pupa. A—head, dorsal view; B—antenna; C—mandible, to same scale as D; D—maxilla; E—labium, ventral portion; c.f.—chitinous fold; m.p.—mental plate; m.t.—median tooth of chitinous fold; F—secondary plate of labium; G—sagittal section of labium at x-x, s.p.—secondary plate; H—segments VIII and IX; K—respiratory trumpet of pupa.

five large ones beyond on each side; and a "secondary plate" of the form shown in the figure, with the distal portion thickly dentate on dorsal surface, and the teeth tending to form a median, two lateral and intermediate groups. *Mandible* with a pair of sparsely feathered hairs (*h.*) on outer side; dentition of five teeth of which two very large, ensiform; dorsal surface with a row of short fine hairs, and a proximal row of long hairs. *Maxilla* rectangular, bi-lobed distally, edges of lobes densely setose, inner lobe with a stout spine on a prominence behind insertions of hairs; outer lobe with a short, stout sensory spine rising from a tubercle almost at edge, palpi with a chitinous plate as shown in fig. 10 D, and three rudimentary jointed digits. *Thorax* rounded, the stout hairs spinulose. *Abdomen*: lateral tufts of hairs not arising from large chitinous tubercles. Siphon tube about two and a half times as long as wide, no pecten, a single tuft near base. Large plate on side of eighth segment with two stout spinulose hairs on its posterior margin. Anal segment about as long as wide, ringed by the plate; dorsal tufts of two long brushes on each side, a single spinulose lateral hair. Anal gills very short, bud-shaped.

PUPA. Respiratory trumpets as shown in figure.

Length: *c.* 13 mm.

*Types.* One male and one female, bred from larvae found in stems of *Bananeira braba* (wild banana) in the forest near Macapa, 21st December, 1921. The species is dedicated to Mr. A. T. S. Hore in recognition of valuable services, which he rendered during the collecting expeditions that were undertaken.

BIONOMICS. The larvae of this mosquito were first discovered together with those of *Wyeomyia negrensis*, sp. n., in a stretch of forest about four miles from Macapa. As mosquitoes were extremely plentiful at this point, a small tract of forest was carefully searched for breeding-places, the larvae referred to were found by splitting up the fronds at the base of a '*Bananeira braba*' (wild banana tree). As we were shifting camp the same day, the larvae had to be transported some distance in a hot sun, and none of them survived the journey.

A few days later a wild banana (Plate XIV, fig. 1) was selected growing at the edge of the forest about ten miles from the spot previously examined, this was cut down close to the roots and transported to camp, where it was placed in a petrol tin, the outer

fronds torn off, and finally the base split up with knives. No larvae were found till the base of the tree was reached, those found were lying in the innermost fronds fully six inches from the outer circumference of the tree. The larvae were found to be carnivorous and had to be kept in separate tubes, where they were fed on a diet of *Culex quinquefasciatus* (*Jatigans*) larvae and pupae, of which they readily destroyed two a day. In captivity they spent most of their time at the bottom of the jars, only coming to the surface at long intervals.

No eggs were discovered, so the length of larval life is unknown. The average pupation period was found to be six days.

*Uranotaenia calosomata* var. *albitarsis*, n. var.

The specimens agree with typical *U. calosomata*, D. and K., in the coloration of the head, thorax and abdomen, but the front and mid tarsi have the last three segments creamy-white scaled, not as in *U. calosomata*, in which they are described as having 'a brassy lustre particularly apically.' Hind tibiae with a conspicuous bluish-white stripe extending the whole length behind; in *U. calosomata* the hind tibiae have only the tips narrowly silvery white. Proboscis with a bluish-white line on basal four-fifths beneath, apparently absent in *U. calosomata*.

HYPOPYGIUM with spines on basal lobe of side-piece extending beyond the apices of the side-pieces; they are very short in Howard, Dyar and Knab's (1912) figure of the hypopygium of *U. calosomata*.

*Type.* Male and female bred from larvae taken in old iron bath at the saw mills near Macapa, 20th January, 1922; *co-type*, female from the same source.

Other species of *Uranotaenia* taken were *U. geometrica*, Theo., ♂ 1, flying in low herbage, Manáos, October, 1921; and *U. lowii*, ♀ 1, Manáos, 15th January, 1922.

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## EXPLANATION OF PLATE XIV.

- Fig. 1. Wild Banana (after having been cut down). Breeding-place of *Megarhinus hoeri*, sp. n. and *Wyeomyia negrensis*, sp. n.
- Fig. 2. 'Carapana Uba' Tree. Breeding-place of *Culex originator*, sp. n.
- Fig. 3. Breeding-place of *Culex* (*Neomelanoconion*) *chrysothorax* at Boski, Manáos.